

BAGGING MODULE

This application claims priority from United States provisional application Ser. No. 60/410,374, filed September 13, 2003, and is incorporated herein by reference in its entirety.

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TECHNICAL FIELD AND BACKGROUND OF THE INVENTION

The present invention generally relates to a bagging module and, more particularly, to a bagging module that is suitable for use in a checkout system, such as a checkout system used at a grocery store or the like.

SUMMARY OF THE INVENTION

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The bagging module of the present invention provides a continuous feed or throughput of at least partially filled bags to a customer by providing a system that allows a checkout clerk to fill one bag while another bag is delivered to the customer.

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In one form of the invention, a checkout system of the present invention includes a front module, a rear module, and a bagging module positioned between the front and rear modules. The bagging module includes a rotatable support surface and an extendible support adapted for supporting at least one bag. The extendible support is mounted to the rotatable support surface and is movable between an operable position, wherein a bag supported by the extendible support is positioned for loading items into the supported bag, and a stowed position.

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In one aspect, the bagging module further includes a base, with the rotatable support surface being supported by the base. For example, the extendible support may at least partially extend into the base when the extendible support is moved to its stowed position.

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According to another aspect, the extendible support includes at least one bag support, which provides at least vertical support or lateral support for a bag. Preferably, the extendible support includes a plurality of bag supports. For example, the bag support or supports may comprise Y-shaped bag supports.

In yet another aspect, the extendible support is manually and/or mechanically extendible or retractable to thereby move the extendible support between its stowed and

operative positions. In addition, the extendible support may be extended or retracted hydraulically, pneumatically, electrically, or a combination thereof.

According to another form of the invention, a checkout system bagging module includes a base for positioning in a checkout system and a rotatable support surface 5 for supporting one or more bags, which is supported by the base. The module further includes an extendible support adapted for supporting at least one bag, which is mounted to the rotatable support surface and which is extendible between an operable position and a stowed position.

In one aspect, the extendible support is extendible or retractable to thereby 10 move the extendible support between its stowed and operative positions.

In yet another form of the invention, a checkout system includes a front module, which has a support surface for supporting items, a rear module with a support surface for supporting items, and a bagging module. The bagging module includes a rotatable table and an extendible support, which is adapted for supporting at least one bag.

15 The extendible support is mounted to the rotatable table and is movable between an operable position wherein a bag supported by the extendible support is positioned for loading items supported on the support surface of the front module and a stowed position wherein the extendible support is lowered below the support surfaces of the front and rear modules.

In one aspect, the rear module includes a conveyor for conveying items across 20 its support surface. In a further aspect, the conveyor includes a member that is extendible over the bagging module when the bagging module is move to its stowed position.

As would be appreciated from the foregoing, the present invention provides a 25 bagging module that permits a substantially continuous feed of bags from a cashier to a customer with minimal handling of the bags. These and other objects, advantages, purposes, and features of the invention will become more apparent from the study of the following description taken in conjunction with the drawings.

#### DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view of a checkout system incorporating a bagging module of the present invention;

30 FIG. 2 is a similar view to FIG. 1 with the bagging module illustrated in a stowed position;

FIG. 3 is a rear perspective view of the checkout system of FIG. 2;

FIG. 4 is a top plan view of the checkout system of FIG. 1 illustrating the bagging module in a stowed position;

FIG. 5 is a side elevation view of the checkout system of FIG. 4;

5 FIG. 6 is an exploded perspective view of the bagging module of the present invention;

FIG. 7 is a side elevation view of the bagging module;

FIG. 8 is a second side elevation view of the bagging module;

10 FIG. 9 is a perspective view of another embodiment of a checkout system incorporating the bagging module of the present invention;

FIG. 10 is another perspective view of the checkout system of FIG. 9; and

15 FIG. 11 is a plan view of the checkout system illustrated in FIGS. 9 and 10 with the bagging module of the present invention in an operative position.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, the numeral 10 generally designates a checkout system, for example, a checkout system that is suitable for use in a grocery store or other retail store. Checkout system 10 includes a front module 10a with a conveyor, onto which a customer deposits or places their items to be purchased and where the cash register is typically located, and a rear module 10b to which the items are delivered for packing in a bag by a clerk or "bagger". The numeral 12 generally designates a bagging module of the present invention, which is especially suitable for positioning between the front and rear modules of a checkout system, such as checkout system 10. As will more fully described below, bagging module 12 is selectively positioned so that it can provide a substantially continuous feed of filled, or at least partially filled, bags to a customer that is standing adjacent the module. This may particularly helpful when the store is short handed on baggers.

As best understood from FIGS. 1-3, bagging module 12 is movable between a stowed position (FIGS. 2 and 3) and an operative position (FIG. 1), where bags can be loaded by the cashier in a manner to provide a continuous feed or throughput of loaded bags to a customer standing adjacent the bagging module of the present invention. Though not limited to a particular type of bag, bagging module 12 is particularly suitable for use with plastic bags and provides a suspension or support system to hold one or more bags and, more preferably, at least two bags and, at least in the case of plastic bags, to hold them in an open position for receiving products therein. Should the cashier have a bagger available, the cashier can move or reconfigure the bagging module, for example manually, mechanically,

hydraulically, pneumatically, electrically, or otherwise, to its stowed position (for example, as shown in FIGS. 2 and 3) with the conveyor or gravity chute of rear module 10b moved to a fully extended position over the bagging module so that items may be delivered from the forward module to the rearward module to the rearward bagging area of checkout system 10.

5 Referring to FIG. 6, bagging module 12 includes a rotatable table 20 and an extendable bag suspension system or support 22. Table 20 may be made from metal, plastic, wood, or a combination of materials. Rotatable table 20 is rotatably supported by a base 24, which is positioned below the extendable conveyor portion of checkout system 10 and positioned between front and rear modules 10a, 10b. Base 24 may assume a number of  
10 different configurations, but is preferably sized to extend between the rearward end of the front module and the forward end of the rearward of checkout system 10. Further details of base 24 are provided below.

In the illustrated embodiment, table 20 comprises a circular plate with a central opening 30 through which it receives extendable support 22. In addition, table 20  
15 includes a sleeve 32 mounted about central opening 30, which includes a detent mechanism 33 or the like to releasably engage extendable support 22 so that extendable support 22 can be raised or lowered between its stowed and operative positions and, further, releasably fixed in at least its operative position. In the illustrated embodiment, sleeve 32 includes a mounting flange 32a that is mounted to table 20 by fasteners or the like. Sleeve 32 preferably  
20 comprises a low friction material, such as plastic, including nylon or the like, to reduce the friction between the sleeve and support 22. Alternately, sleeve 32 may have a low friction insert. In the illustrated, detent mechanism 33 comprises a spring-loaded pin that is extended into a corresponding structure, such as recess or hole, to mechanically couple sleeve to the extendible support; however, it can be appreciated that other detent mechanisms or other  
25 releasable coupling devices, including non-mechanical coupling devices, may be used. For example, non-mechanical coupling devices may include electromagnets, which can be electrically actuated to selectively couple or decouple from the extendible support. Alternately, the coupling device may comprise a combination of non-mechanical and mechanical components, such as an electromagnetically or hydraulically or pneumatically  
30 driven pin, which mechanically engages the support.

Support 22 includes a central support member 34 that extends through sleeve 32 and opening 30, and one or more bag support members 36. Central support member 34 is preferably formed from a rigid material, such as metal, plastic, including reinforced plastic,

or wood, or a combination of materials. The term "member" as used herein is not intended to be limited to a single unitary member and may comprise one or more assembled components, as would be understood by those skilled in the art. In the illustrated embodiment, adjustable support 22 includes three bag support members 36; however, it can be appreciated that the  
5 number of bag support members may be increased or decreased, as illustrated in the second embodiment. Depending on the type of bags, bag support members 36 may provide vertical support and/or lateral support to the respective bags. For example, for paper bags, bag support members 36 provide lateral support. For plastic bags, bag support members 36 provide at least vertical support to the bags and, further, optionally assist in holding the bags  
10 open while the bag is loaded.

Referring again to FIG. 6, in the illustrated embodiment, bag support members 36 comprise Y-shaped arms 38 that are mounted at their respective distal ends 38a to central support member 34 by, for example, a hub assembly 40. Arms 38 may be formed from metal wire or from other suitable rigid materials. Preferably, Y-shaped arms 38 are equally spaced around tubular member 34. However, they may be unevenly spaced should a greater distance be desired between an adjacent pair of support members. For example, for a three-bag assembly, the bag support members may be spaced approximately 120° apart at their distal ends. Proximal portions 38b of Y-shaped arms 38 provide a mounting surface for the plastic bags or otherwise provide a lateral support for paper bags, should paper bags be used in conjunction with the bagging module of the present invention.  
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In the illustrated embodiment, central support member 34 comprises a rectangular tubular member and includes at least one indent or mounting opening that cooperates with detent mechanism 33 of collar 32 to vertically fix the position of adjustable support 22, for example, in its operative or extended position (as shown in FIG. 1). To return  
25 the adjustable support 22 to its stowed or lowered position, detent mechanism 33 is disengaged from the indent or mounting opening so that extendable support 22 may be moved downward, for example manually moved downward, to its stowed or its retracted position. It should be understood, however, that central support member 34 may comprise a round tubular member or a solid rod or the like as well. However, in the interest of reducing  
30 the weight of the bag support member, it may be beneficial to provide a hollow structural member for central support member. In addition, central support member 34 may include a plurality of indents or mounting openings to thereby fix the position of the extendable support in its stowed position, for example, or in an intermediate position.

Again, referring to FIG. 6, table 20 is supported on base 24 by a bearing assembly 44 so that table 20 is rotatable about vertical axis 46. In this manner, when a cashier has moved the extendable support 22 to its operative position, the cashier may load a bag suspended or supported by one of the Y-shaped arms and, thereafter, rotate table 20 so

5 that the bag that is filled is moved to a second position so that the cashier may thereafter fill the adjacent bag with items. After the second bag is filled, the cashier can then rotate the table 20 to a third position to present the first loaded bag to a customer that may be standing on the opposed side of the module. In this manner, the customer may unload the bag from the table and place the loaded bag in their cart. This process may continue until all of the

10 items have been loaded into bags. As a result, the baggage module of the present invention provides a continuous feed or throughput of loaded bags to the customer without the need of a separate bagger. In the illustrated embodiment, bearing assembly 44 includes a base 44a, such as an annular base, that is mounted to base 24 and an upper member 44b, such as an upper annular member, to which table 20 is secured, for example, by fasteners. Upper

15 member 44b is supported on base 44a by bearings, as would be understood by those skilled in the art, to enable rotation of upper member 44b and in turn table 20.

In the illustrated embodiment, base 24 includes a front side 24a, which faces the customer side of checkout system 10, and a back side 24b, which faces the cashier side of checkout system 10. Ends 24c and 24d of base 24, respectively face the rearward end of front module 10a and rearward module 10b. In the illustrated embodiment, front side 24a and ends 24c and 24d are closed by side frame members 50a, 50b, and 50c, respectively, which are supported on a platform 52. Side frame members 50a, 50b, and 50c may be conventional of materials in construction and may be made from sheet metal or pressed board or a combination or the like. Platform 52 comprises a box shaped platform, which is

20 similarly formed form panels of sheet metal, pressed board, or a combination thereof, with a transverse passage formed therethrough 53 for allowing wiring, cables or the like, to pass through platform. In addition, base 24 includes an upper side 54 that extends and is supported by side frame members 50a, 50b, and 50c to form a cabinet, which may be open on one or more sides (as shown in FIG. 1). Back side 24b includes a brace member 50d, which

25 is mounted between side frame members 50b and 50c to provide support to upper side 54 along the back side edge of upper side 54. In addition, upper side 54 includes a central opening 56 for receiving extendable support 22.

In the illustrated embodiment, bearing assembly 44 is supported by base and secured to a plurality of mounting bosses 58 that are provided on a respective pair of elongated support members 58a, which are mounted to side frame member 50a and brace member 50d. Mounting bosses 58 are positioned in opening 56 generally at or below the upper surface 54a of upper side 54 to lower bearing assembly 44 so that the space between lower surface 20a of table 20 and upper surface 54a of upper member 54 is minimized to thereby minimize the deflection of table 20. Alternately, bearing assembly 44 may be supported by and secured to upper side 54.

Referring to FIGS. 9-11, the numeral 110 generally designates another embodiment of a checkout system, which may incorporate another embodiment of a bagging module 112 of the present invention. Similar to the previous embodiment, bagging module 112 is positioned between a forward module 110a and a rearward conveyor module 110b and is supported such that its adjustable support 122 can move between an operative position to permit a continual feed or throughput of loaded (or at least partially loaded) bags to the customer or a stowed position below a gravity feed ramp 111 that delivers product to the rear module for bagging by a clerk or bagger. In the illustrated embodiment, bagging module 112 includes four bag supports 136 and, further, incorporates a rectangular-shaped table 120. Furthermore, central support member 122 comprises a larger diameter tubular member, which may provide increased stability of support 122.

While several forms of the invention have been shown and described, other forms will now be apparent to those skilled in the art. For example, the movement of extendable support 22 or 122 may be powered or power assisted, for example, by a cylinder, for example, an air cylinder or a hydraulic cylinder, a motor, such as a servo motor, an inflatable bladder, or the like, which is controlled by a control system that is operable by the cashier so that the extendable support may be moved between its operative and stowed position mechanically, hydraulically, electrically, pneumatically, or a combination thereof. In addition, the movement of extendible support may be spring assisted so that the weight of the central support member and bag support members is reduced. Furthermore, as previously noted, the position of the extendible support is preferably releasably fixed in at least its operative position and may be fixed mechanically or magnetically or frictionally, for example, by a conventional lever with a cam surface or a band that is moved in and out of frictional engagement with the central member 34, for example, by pivoting the lever. IN addition, though illustrated as wire members, bag supports 36 and 136 may comprise plate

members that extend partially down central support member 22 or 122 or may extend to table 20 or 120. Alternately, a net or another sheet of material may extend between the respective proximal portions 38a of the Y-shaped arms 38 and table 20 or 120 to provide additional lateral support to the bags, especially plastic bags. Therefore, it will be understood that the  
5 embodiments shown in the drawings and described above are merely for illustrative purposes, and are not intended to limit the scope of the invention, which is defined by the claims that follow as interpreted under the principles of patent law including the doctrine of equivalents.